

**Original Article**  
**Orthopaedics**

# EFFECTIVENESS OF PLATELET RICH PLASMA (PRP) IN SUPRASPINATUS TENDINOPATHY

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Article submitted on: 18 July 2016

Article Accepted on: 27 July 2016

**Abstract:**

Supraspinatus tendinopathy is a common shoulder problem. Platelet-rich plasma (PRP) is a natural concentrate of autologous growth factors stored in  $\alpha$  granules now being widely tested in different fields of medicine for its potential in enhancing the regeneration of tissue with low healing potential. We studied the effect of PRP in 20 patients with subacromial impingement and supraspinatus tendinopathy.

**Key words:** Platelet rich plasma (PRP), subacromial impingement, supraspinatus tendinopathy, subacromial space.

## Introduction

Rotator cuff tendinopathy including supraspinatus tendinopathy is an important condition of the upper extremity, affecting 1 in 50 adults<sup>1</sup>; incidence increases with age, making shoulder pain a common musculoskeletal complaint in adults over age 65.<sup>2,3</sup> Its greatest impact is on workers with repetitive and high-load upper extremity tasks and on athletes; shoulder pain and weakness are associated with significant morbidity, affecting activities of daily living, recreation, and work life.<sup>4</sup>

The pathophysiology of RCT is characterized by progressive, degenerative changes within the tendon as a result of overuse, altered shoulder mechanics, and a limitation of the normal tendon repair system

with a fibroblastic and a vascular response known as angiofibroblastic degeneration.<sup>5</sup>

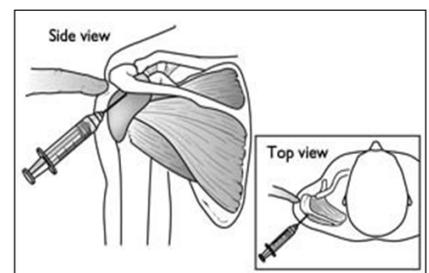
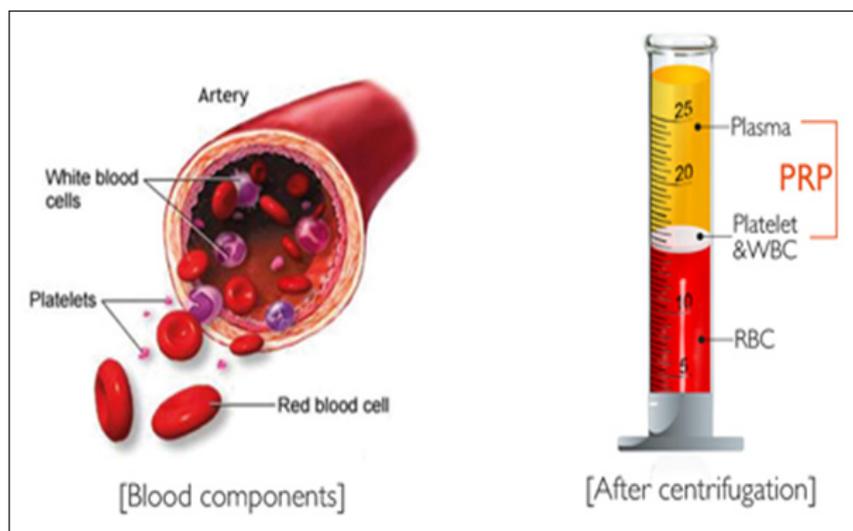
No therapy has been shown to uniformly improve clinical, functional, and radiological outcomes across severity grades of RCT, and no therapy specifically targets the presumed degenerative pathology of RCT.<sup>6</sup>

Platelet-rich plasma (PRP) is a preparation of concentrated autologous platelets containing growth factors and bioactive substances essential to musculoskeletal healing.<sup>7</sup> In vitro and animal model studies suggest that direct in vitro application of PRP to injured tissue may address the structural failure of the tendon in RCT<sup>8</sup> and that PRP might thereby accelerate healing and repair of injured tissue.<sup>8-10</sup>

months or more, failed conservative treatment of at least 4 weeks of formal physical therapy (including rotator cuff strengthening and scapular and proprioceptive stabilization).

Exclusion criteria included joint instability defined by positive apprehension and relocation test, significant upper extremity comorbidity, anticoagulation therapy, history of shoulder surgery, and corticosteroid injection within 3 months.

The primary outcome measure for all participants was a score on a 0-10 visual analog scale (VAS) assessing current resting pain at baseline and at 2, 6, 8 and 12 weeks. 100 mL blood was drawn from the antecubital vein and centrifuged to yield 16 cc of PRP. Under aseptic conditions, using a 10 ml syringe and a 23 G needle, 6 cc of PRP (without activation with CaCl<sub>2</sub>/thrombin) was injected into the subacromial space of the involved right shoulder. PRP was activated by endogenous thrombin and patient's shoulder was manipulated to allow the PRP to distribute itself throughout the joint before becoming gel.



### Site of injection in subacromial space

Patient was asked to perform regular physiotherapy for the shoulder and was discouraged to use anti-inflammatory medication.

## Result

20 patients were enrolled (16 male and 4 female) with a mean age of 46.2

Early clinical evidence suggests that PRP improves pain and function outcomes in some tendinopathies compared to control injection<sup>11</sup> and baseline status.<sup>12</sup>

We therefore evaluated PRP for to test the hypothesis that a single PRP injection improves clinical and functional outcome measures compared to baseline status in patients with subacromial impingement and

supraspinatus tendinopathy

## Methods

Inclusion criteria were a clinical diagnosis of subacromial impingement and supraspinatus tendinopathy (painful arc of movement between 90° to 120° of abduction; Neer Impingement Sign, Hawkins-Kennedy Test and Jobe supraspinatus test being positive) with symptoms for 3

$\pm 12.2$  years. Duration of shoulder pain ranged from 3 to 37 months (mean  $6.8 \pm 1.9$  months). The baseline VAS of  $7.5 \pm 0.3$  points indicated a moderate to severe mean pain level prior to injection.

The primary outcome VAS score improved by 95% compared

to baseline, from  $7.5 \pm 1$  points at baseline to  $1.5 \pm 0.6$  points by week 6 and  $1 \pm 0.2$  ( $P = .0001$ ) by week 12.

Strength in the supraspinatus also increased (assessed by Jobe test). Patients were able to perform their routine daily activities (like combing hair) with much less pain.

Measure (units)	Baseline Mean (SE)	Mean (SE) Weeks 2	Mean (SE) Weeks 6	Mean (SE) Weeks 8	Mean (SE) Weeks 12	P value
VASpain (0-10 points)	$7.5 \pm 1$	$4.3 \pm .9$	$1.5 \pm 0.6$	$1.3 \pm 0.4$	$1 \pm 0.2$	.0001

## Discussion

Rotator cuff tendinopathy (RCT) including supraspinatus tendinopathy, is an important condition of the upper extremity, affecting 1 in 50 adults<sup>1</sup>; incidence increases with age, making shoulder pain a common musculoskeletal complaint in adults over age 65.<sup>2,3</sup> Its greatest impact is on workers with repetitive and high-load upper extremity tasks and on athletes; shoulder pain and weakness are associated with significant morbidity, affecting activities of daily living, recreation, and work life.

Platelet-rich plasma (PRP) is a preparation of concentrated autologous platelets containing growth factors and bioactive substances essential to musculoskeletal healing.<sup>1</sup> PRP has been suggested as a treatment option for refractory tendinopathies, including rotator cuff tendinopathy.<sup>2</sup> Early clinical evidence suggests that PRP improves pain and function outcomes in some tendinopathies compared to control injection and baseline status.<sup>3</sup>

In our study, patients showed significant improvement after a single injection of PRP. Thus it can be effectively used for the treatment of

supraspinatus tendinopathy.

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